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"A Statistical Algorithm for Recommending Minimum Sufficient Groundwater Sampling Frequencies at an EPA Superfund Groundwater Remediation Project"

By
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The Groundwater remediation effort at Lawrence Livermore National Laboratory includes regular sampling of over 1000 groundwater monitoring wells for a variety of constituents of concern-too many to permit regular and frequent manual evaluation of contaminant trends . This paper describes a computer based algorithm used to help decide whether these wells should be sampled quarterly, semi-annually, annually, or biennially. The algorithm is based on the logic that locations where contaminant concentrations show greater uncertainty or more rapid changes should be sampled more frequently. The algorithm output, which includes graphical review as well as tabular output, is designed to draw attention to locations that most need it. The algorithm provides a logical and readily acceptable basis for negotiating with the regulatory agencies for less frequent monitoring in many wells. Regulatory oversight of the remediation effort has also been improved by the existence of a well defined and clearly documented decision making process (one that regulators can easily explain to stakeholders). Regular use of the algorithm has resulted in faster and more thorough review of sampling results, more consistent and objective decisions about sampling frequency, and substantial cost savings.

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